Amendments to the Claims

1. (Currently Amended) An apparatus for use in collecting airborne particles, the apparatus comprising ~~in~~ a collection vessel comprising an open end and a closed end spaced from the open end, the apparatus further comprising a collection-vessel retaining member adapted to be removably coupled to the collection vessel, the retaining member comprising an air-inlet conduit for permitting air to flow into the collection vessel through the open end and an air-outlet conduit for permitting air to exit the collection vessel through the open end, the air-inlet conduit and the air-outlet conduit being configured such that, when the collection vessel is coupled to the retaining member, air flowing into the collection vessel establishes a cyclonic flow path to cause airborne particles to separate from the air and collect in the collection vessel.

2. (Original) The apparatus of claim 1, wherein the air-inlet conduit is non-orthogonal to a plane that is parallel to the open end of the collection vessel.

3. (Original) The apparatus of claim 2, wherein the air-inlet conduit extends at an angle of about 30° to 45° with respect to the plane.

4. (Original) The apparatus of claim 1, wherein the air-outlet conduit extends generally axially relative to the collection vessel.

5. (Original) The apparatus of claim 1, wherein the retaining member is threaded to receive corresponding threads on the collection vessel so that the collection vessel can be easily screwed onto and removed from the retaining member.

6. (Original) The apparatus of claim 1, wherein the retaining member comprises a unitary body, the air-inlet conduit comprises a first passageway defined in the body, and the air-outlet conduit comprises a second passageway defined in the body.

7. (Original) The apparatus of claim 6, wherein the first passageway extends generally tangentially with respect to an inner surface of the collection vessel.

8. (Currently Amended) The apparatus of claim 1, wherein:

the collection vessel is a first collection vessel, the air-inlet conduit comprises a first air-inlet conduit, and the air-outlet conduit comprises a first air-outlet conduit; and

the apparatus further comprises a second collection vessel and the retaining member is adapted to be removably coupled to ~~a~~ the second collection vessel, the retaining member further comprising a second air-inlet conduit and a second air-outlet conduit, the first air-outlet conduit being in fluid communication with the second air-inlet conduit so that air flowing through the first air-outlet conduit flows into the second collection vessel through the second air-inlet conduit and exits the second collection vessel through the second air-outlet conduit, the second air-inlet conduit and second air-outlet conduit being configured to establish a cyclonic flow path in the second collection vessel to cause airborne particles to separate from the air flowing through the second collection vessel.

9. (Original) The apparatus of claim 8, wherein the particles deposited in the first collection vessel are generally larger than the particles deposited in the second collection vessel.

10. (Original) The apparatus of claim 8, wherein the retaining member is configured to support the first and second collection vessels in the same orientation.

11. (Original) The apparatus of claim 10, wherein the retaining member is configured to support the first and second collection vessels in a generally vertically upright orientation.

12. (Previously Presented) An apparatus for use in collecting airborne particles comprising:

a collection vessel in which airborne particles are collected for analysis, the collection vessel comprising a microcentrifuge tube having an open end that is orthogonal to a line extending longitudinally with respect to the tube;

an air-inlet conduit for conducting air into the collection vessel, the air-inlet conduit extending at an angle with respect to a plane that is parallel to the open end, the air-inlet conduit being non-orthogonal and non-parallel to said plane; and

an air-outlet conduit for conducting air out of the collection vessel;

wherein the air-inlet conduit and the air-outlet conduit are situated to cause air flowing through the collection vessel to create a vortex, thereby causing airborne particles to separate from the air flowing through the collection vessel.

13. (Original) The apparatus of claim 12 wherein:

the collection vessel is a first collection vessel, the air-inlet conduit comprises a first air-inlet conduit, and the air-outlet conduit comprises a first air-outlet conduit; and

the apparatus further comprises:

a second collection vessel;

a second air-inlet conduit in fluid communication with the first air-outlet conduit so that air flowing through the first air-outlet conduit is conducted into the second collection vessel through the second air-inlet conduit, the second air-inlet conduit being non-orthogonal to a line extending longitudinally with respect to the second collection vessel; and

a second air-outlet conduit for conducting air out of the second collection vessel;

wherein the second air-inlet conduit and the second air-outlet conduit are situated to cause air flowing through the second collection vessel to create a vortex, thereby causing airborne particles to separate from the air flowing through the second collection vessel.

14. (Original) The apparatus of claim 13, wherein the first collection vessel is supported in the same orientation as the second collection vessel.

15. (Original) The apparatus of claim 12, further comprising a vacuum source fluidly connectable to the air-outlet conduit to draw air through the collection vessel.

16. (Original) The apparatus of claim 12, wherein:

the collection vessel has an open end;

the air-inlet conduit conducts air to flow into the collection vessel through the open end; and

the air-outlet conduit conducts air to flow outwardly from the collection vessel through the open end.

17. (Original) The apparatus of claim 12, further comprising an air-flow member adapted to be removably coupled the collection vessel, wherein the air-inlet conduit and the air-outlet conduit are passageways defined in the air-flow member.

18. (Original) The apparatus of claim 17, wherein the air-outlet conduit extends into the collection vessel through an open end thereof.

19. (Original) The apparatus of claim 13, further comprising an air-flow member adapted to be removably coupled the first and second collection vessels, wherein the first and second air-inlet conduits and the first and second air-outlet conduits are passageways defined in the air-flow member.

20. (Original) The apparatus of claim 12, wherein the air flow in the collection vessel is a reverse-flow cyclone.

21. (Original) The apparatus of claim 12 having a 50% cut-off diameter of 2 microns.

22. (Original) A method for analyzing airborne particles, the method comprising:

flowing untreated air into a collection vessel;

establishing a reverse cyclonic air flow pattern in the collection vessel such that particles are separated from the air and are collected in the collection vessel; and

performing an analysis of the particles separated from the air.

23. (Original) The method of claim 22, wherein performing an analysis of the particles separated from the air comprises performing an analysis of the particles while the particles are still in the collection vessel.

24. (Original) The method of claim 23, wherein performing an analysis of the particles comprises performing PCR on the particles while the particles are still in the collection vessel.

25. (Original) The method of claim 23, wherein performing an analysis of the particles comprises detecting for the presence of a specific type of particle while the particles are still in the collection vessel.

26. (Original) The method of claim 25, wherein the presence of a specific type of particle is detected by an assay that is contained in the collection vessel as air flows through the collection vessel and particles are separated from the air.

27. (Original) The method of claim 22, wherein:

the collection vessel comprises a first collection vessel; and

the method further comprises:

conducting air from the first collection vessel into a second collection vessel; and

establishing a cyclonic air flow pattern in the second collection vessel such that particles are separated from the air and are collected in the second collection vessel.

28. (Original) The method of claim 27, wherein the particles collected in the second collection vessel are generally smaller than the particles collected in the first collection vessel.

29. (Original) The method of claim 27, further comprising performing an analysis on the particles that are collected in the second collection vessel.

30. (Original) The method of claim 27, wherein the analysis is performed while the particles are still in the second collection vessel.

31. (Original) The method of claim 22, wherein the analysis of the particles is performed while air is flowing through the collection vessel.

32. (Original) The method of claim 22, wherein the particles are bioaerosols.

33. (Original) The method of claim 22, wherein the particles collected in the collection vessel are approximately equal to and greater than 2 microns in size.

34. (Previously Presented) A method for collecting airborne particles for analysis, the method comprising:

flowing air through the open end of a microcentrifuge tube along a flow path in a direction that extends generally tangentially with respect to an inner surface of the microcentrifuge tube, the open end being orthogonal to a line extending longitudinally with respect to the tube, the flow path being non-orthogonal and non-parallel to a plane defined by the open end, wherein the air flowing through the microcentrifuge tube establishes a cyclone; and

separating airborne particles from the air flowing through the microcentrifuge tube.

35. (Previously Presented) The method of claim 34, wherein the air flowing through the microcentrifuge tube establishes a reverse-flow cyclone.

36. (Previously Presented) The method of claim 34, wherein the air flowing into the microcentrifuge tube is conducted through an inlet conduit of an air-flow fitting coupled to the microcentrifuge tube, and wherein air flowing out of the microcentrifuge tube is conducted through an outlet conduit of the air-flow fitting.

37. (Previously Presented) The method of claim 34, wherein air flowing outwardly from the microcentrifuge tube is conducted into a secondary collection vessel to further separate airborne particles from the air flow.

38. (Previously Presented) The method of claim 33, further comprising performing an analysis on the particles that are separated from the air flowing through the microcentrifuge tube.